

In the Drawings

Replace the originally filed drawings with the appended replacement sheets nos. 1-7.

REMARKS

By the present Amendment, claims 1-14 are cancelled and claims 15-28 are added. This leaves claims 15-28 pending in the application, with claim 15 being independent.

Substitute Specification

The specification is revised to eliminate grammatical and idiomatic errors in the originally presented specification. The number and nature of the changes made in the specification would render it difficult to consider the case and to arrange the papers for printing or copying. Thus, the substitute specification will facilitate processing of the application. The substitute specification includes no “new matter”. Pursuant to M.P.E.P. § 608.01(q), voluntarily filed, substitute specifications under these circumstances should normally be accepted. A marked-up copy of the original specification is appended hereto.

Objection to Drawings

The drawings are objected to on the ground that certain alleged blank boxes in the drawings should be labeled. The newly submitted drawings add the appropriate labels for items 10, 14, 36, 136 and 38, as noted in the Office Action.

Rejections Under 35 U.S.C. § 112, Second Paragraph

The originally filed claims stand rejected under 35 U.S.C. § 112, second paragraph, as being indefinite. The originally filed claims have been rewritten to avoid the phrases “may be” and “desired manner” and to provide proper antecedent basis for all terminology.

Thus, all pending claims are definite and comply with the requirements of 35 U.S.C. § 112.

Rejections under 35 U.S.C. § 103

Claim 15 covers a locking system 1 for a safety switch to monitor a protective device 47-48 on a machine 50 comprising a read head 2 and an actuator 3. The read head has a first component set 10 with electric structural components, and is coupled to one of a protective device 47-48 and a machine 50. The actuator has a second component set 14 with electric structural components, and is mounted on the other of the protective vice and the machine. The first and second components interact without electrical contact to control the safety switch. A switchable electromagnet 7 is mounted on one of the head and the actuator, and generates a magnetic field. A counterelement 12 is mounted on the other of the read head and the actuator, and is operable with the electromagnet to lock the actuator on the head. A sensor element 31-33 controls a locking force on the actuator and the read head caused by the magnetic field, and has an output signal being a function of the magnetic field generated by the electromagnet.

By forming the locking system in this manner, the magnetic forces are effectively controlled to ensure complete locking of the device prior to operation of the machine.

Original claims 1-14 stand rejected under 35 U.S.C. § 103 as being unpatentable over U.S. Patent No. 6,609,738 to Roth in view of U.S. Patent No. 5,429,399 to Geringer. The Roth patent is cited for an electronic locking system having a read head 24 with a plurality of magnetically actuated reed switches 62, 64, 66, and an electromagnetic actuator 18 responsive to signals from the magnetically actuated switches to lock and unlock an element. The Geringer patent is cited for an

electromagnetic locking system having electronically controlled actuator provided with specific control functions. In support of the rejection, it is contended it would be obvious to use the Geringer control function in the Roth electromagnetic locking system. Relative to claims 5 and 6, the mounting locations of the sensor element are considered obvious. Relative to claim 10, the Roth patent is alleged to show the use of multiple sensors. Relative to claim 11, the modified sensor assembly is alleged to be adjustable. Relative to claim 13, the use of Hall detectors instead of the reed switches in the Roth patent is alleged to be obvious.

Claim 9 stands rejected under 35 U.S.C. § 103 as being unpatentable over the Roth and Geringer patents as noted above, when further considered in view of the U.S. Patent Application Publication No. US2004/0051608 to Donce. The Donce publication is cited for an electromagnetic actuator having a control circuit connected to it. In support of the rejection, it is contended that it would be obvious to have control circuitry in series with the Roth coil as allegedly suggested by the Donce published application.

Since the Roth and Geringer patents both relate to electromagnetic door locking systems, neither one relates to use with a safety switch to monitor and control the operation of a machine based on the monitored position of a protective device for the machine. Specifically, neither the Roth patent nor the Geringer patent disclose to a read head coupled to one of a protective device and a machine and an actuator mounted on the other of a protective device and a machine such that the electric structural components of the component sets located within the read head and the actuator interact without electrical contact to control the safety switch. As disclosed, for example, in U.S. Patent Nos. 6,409,083 and 6,989,727, cited in the included Information Disclosure Statement, a safety switch is a particular switch used to monitor moveable protective

device, such as a door, cover, grate or the like of a machine to which it is attached, particularly a machine tool. Such safety switches ensure that the protective device is in a proper position before the machine can operate in order to protect the operator. When the safety cover or covering is not in the appropriate position, the safety switch prevents electrical power from being supplied to the machine preventing the machine from operating and injuring the operator.

In contrast, the Roth and Geringer patents do not disclose or relate to a safety switch as recited in the presently pending claims. Each patent relates to a door locking system for emergency exit doors in buildings. No connection to a machine or the controlling of electrical power to a machine depending on the positioning of a protection device is disclosed or suggested by either of these two cited patents. Thus, the Roth patent not disclose “everything claimed except for the specific control function provided to the electromagnetic actuator” as contended in the Office Action. Since the Roth and Geringer patents relate solely to door locking systems, they do not disclose or render obvious the claimed read head and actuator attached to a protective device and machine as recited in claim 15.

Specifically, the Roth patent discloses an electromagnetic lock having an electromagnetic assembly 16 coupled to the door frame 14 and an armature plate 20 mounted to door 10 to provide a locking mechanism. A sensor 24 mounted on the door frame cooperates with a sensor 40 mounted on the door to detect when the door is fully closed. A controller 80 is connected to the sensor assembly and to the electromagnet as well as to alarm 82 by electrical wires 25. However, the Roth sensor 24 merely cooperates with the permanent magnet 40, does not control the locking force of the magnetic field generated by the electromagnet, and does not have an

output signal being a function of the magnetic field generated by the electric magnet. In fact, Roth sensor 24 does not appear to function in combination with the electromagnet.

Additionally, the Office Action appears to treat sensor 24 as the read head. If Roth sensor 24 is the read head, the Roth system does not include the electromagnet or counterelement as required in claim 15. Further, the Roth sensor 24 cannot serve both as the read head and the sensor element recited in claim 15. Such double reading of that feature renders the rejection untenable.

The Geringer patent also does not disclose a locking force caused by a magnetic field of an electromagnet and controlled by a sensor element. The Geringer microprocessor base control circuitry does not control current through the armature in response to a sensor element with the output signal of the sensor element being a function of the magnetic field generated, as claimed. In the portion of the Geringer patent cited in the Office Action, the control merely relates to the control of a display to advise of the amount of time it will take until the door is unlocked after a demand has been triggered and to indicate whether or not the door lock is on. Clearly, such control does not teach the sensor element recited in claim 15.

Accordingly, claim 15 is patentably distinguishable over the Roth and Geringer patents, considered alone or in any obvious combination thereof. None of the other cited patents cure these deficiencies in the cited and applied patents.

Claims 16-28, being dependent upon claim 15, are also allowable over the cited patents for the above reasons. Moreover, these dependent claims recite additional features further distinguishing them over the cited patents. Specifically, the sensor element generating an analog signal of claim 16, the adjustability of the locking force of claim 17, the sensor element

measuring the magnetic field generated by the electromagnet of claim 18, the mounting of the sensor element on the actuator claim 19, the mounting of the sensor element on the read head of claim 20, the switching states and their control of claim 21, the generator coil of claim 22, the connection of the sensor element and the generator coil of claim 23, the plurality of sensor elements of claim 24, the adjusting means of claim 25, the read switch of claim 26, the Hall element of claim 27, and the pivoted connection of claim 28, are not anticipated or rendered obvious by the cited patents, particularly within the overall claim combination.

The specific mounting locations of the sensor elements are not mere obvious design considerations. The absence of any prior art disclosing or suggesting the claimed mounting locations demonstrates the failure to provide a prima facie case of obviousness. These multiple sensors and the adjustability are not disclosed within the Roth patent in the same environments as required by the present claimed invention.

Absent any disclosure of Hall elements, nothing in the prior art demonstrates the obviousness of substituting the Roth read switches with Hall elements, as claimed.

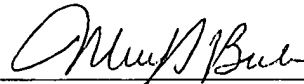
Relative to the series connection of the sensor element and the generator coil recited in the original claim 9 and now in claim 23, the Donce patent application publication is cited. However, that publication discloses a non-analogous environment that should not render the subject matter of this claim obvious.

Moreover, the Donce patent application publication is only effective as a prior art against the present application as of the July 15, 2003 filing date of its U.S. national phase and its March 18, 2004 publication date. The publication of the corresponding International application of the Donce patent application publication is July 18, 2002. This application is entitled to the

German application priority application filing date of March 8, 2002. Although the Donce patent is based on a PCT application filed January 10, 2002, the U.S. national phase of that International application was not filed until July 15, 2003. Since the International application was published in French, and not in English, the effective reference date is July 15, 2003 which is after the priority date of this application. Accordingly, the Donce patent application publication is not prior art against this application.

In view of the foregoing, claims 15-28 are allowable. Prompt and favorable action is solicited.

Respectfully submitted,



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